

Taxon: *Combretum indicum*

Family: Combretaceae

Common Name(s): Burma creeper  
quisqualis  
Rangoon creeper

Synonym(s): *Quisqualis indica* L. (basionym)

Assessor: Assessor

Status: Assessor Approved

End Date: 12 Sep 2014

WRA Score: 10.0

Designation: H(HPWRA)

Rating: High Risk

Keywords: Tropical Liana, Naturalized, Thorny, Suckers, Water-dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	y
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	y
412	Forms dense thickets		
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m <sup>2</sup> )	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[No evidence of domestication] "Combretum indicum is native to tropical Asia. There is still doubt whether it is indigenous to East Africa or was introduced there long ago. It is nowadays widely cultivated throughout the tropics and subtropics, mainly as an ornamental plant, and has become naturalized in many localities."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Rain forests, low woods, thickets, hedges, mountains, dry hillsides, riversides, roadsides, wasteland, also cultivated; below 1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, S Jiangxi, Sichuan, Taiwan, Yunnan; cultivated in Zhejiang [Bangladesh, Cambodia, India (including Andaman Islands), Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, Vietnam; coastal E Africa, Indian Ocean islands, Pacific islands"

202	Quality of climate match data	High
	Source(s)	Notes
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[Elevation range in tropical climates exceeds 1000 m, demonstrating environmental versatility] "Combretum indicum occurs in shrub and tree savanna, forest margins, along stream banks, also in disturbed habitats, including roadsides, waste places, rice fields and railway tracks, from sea-level up to 1800 m altitude."

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Rain forests, low woods, thickets, hedges, mountains, dry hillsides, riversides, roadsides, wasteland, also cultivated; below 1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, S Jiangxi, Sichuan, Taiwan, Yunnan; cultivated in Zhejiang [Bangladesh, Cambodia, India (including Andaman Islands), Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, Vietnam; coastal E Africa, Indian Ocean islands, Pacific islands"

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"introduced to other parts of tropical Africa and Central and South America; widely cultivated and often naturalized in the tropics"

301	<b>Naturalized beyond native range</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Corlett, R.T. 1988. The Naturalized Flora of Singapore. Journal of Biogeography 15(4): 657-663	"Appendix 1 Exotic vascular plant species naturalized in Singapore, with habit, region of origin, probable reason for introduction (orn.=as ornamental), date of first record in Singapore (R=first record in Ridley (1922-25) and current status (c=common, l=local, r=rare)." [Quisqualis indica included in list as rare]
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"introduced to other parts of tropical Africa and Central and South America; widely cultivated and often naturalized in the tropics"
	Frohlich, D. & Lau, A. 2014. New plant records for the Hawaiian Islands 2012–2013. Bishop Museum Occasional Papers 115: 7–17	"Quisqualis indica L. New naturalized record. Quisqualis indica, a rampant climber native to Malaysia and possibly Africa (Staples & Herbst 2005), was found spreading sparingly outside a home site and at a nearby wetland, where it reached over 7 m into the canopy of a tree. This species can be differentiated from other members of the Combretaceae family in Hawai'i by its climbing habit and tube-shaped flowers, which start out white and turn red with age (Staples & Herbst 2005). Material examined. O'AHU: Kailua, near 1659 Kanapu'u Dr., Jul 2013, US Army 319."

Qsn #	Question	Answer
	Queensland Government. 2014. Weeds of Australia - Rangoon creeper - <i>Quisqualis indica</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm</a> . [Accessed 12 Sep 2014]	"This species is occasionally naturalised in northern Queensland and the northern parts of the Northern Territory. It is possibly also naturalised in south-eastern Queensland. Naturalised overseas in New Caledonia, south-eastern USA (i.e. Florida) and the Caribbean (e.g. Puerto Rico and the Virgin Islands)."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Dunlop, E., Hardcastle, J. & Shah, N.J. 2005. Cousin and Cousine Islands Status and Management of Alien Invasive Species. World Bank / GEF funded project: 'Improving management of NGO and privately-owned Nature Reserves and high biodiversity islands in Seychelles'	" <i>Q.indica</i> is a semi-climbing shrub possessing heads of sweetly scented flowers. Introduced as an ornamental, it has shown invasive tendencies, climbing onto the crowns of <i>Ficus</i> , <i>Euphorbia</i> and <i>Pisonia</i> trees. Through vegetative propagation it has the potential to dominate large areas as it has in regions of Mahe and Praslin (Schumacher and Wuthrich, 2000). Control: currently it is confined to one location near the marsh where it is being managed with 'vigilant' herbicide (see section 4.1.2.1)."
	Csurhes, S. & Edwards, R. 1998. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	" <i>Quisqualis indica</i> is an evergreen vine (to c. 3m tall) with oval leaves (c. 10cm long) and red or orange-red flowers. Native to Malaysia, it exists around old settlements in the Northern Territory and is showing signs of weediness (Dunlop, pers. comm.)."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[Impacts unspecified] "It is considered invasive in Australia and several of the islands in the Pacific Ocean."
	Queensland Government. 2014. Weeds of Australia - Rangoon creeper - <i>Quisqualis indica</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm</a> . [Accessed 12 Sep 2014]	[Weedy. Potential environmental weed] "Rangoon creeper ( <i>Quisqualis indica</i> ) is regarded as an emerging environmental weed in northern Queensland and the northern parts of the Northern Territory and is a potential environmental weed or "sleeper weed" in other warmer and wetter parts of the country. This garden ornamental is persisting and becoming weedy around old settlements in the northern parts of the Northern Territory. For example, Rangoon creeper ( <i>Quisqualis indica</i> ) is regarded as a medium priority weed species in aboriginal lands in the Northern Land Council area and has been recorded in Holmes Jungle Nature Park. Rangoon creeper ( <i>Quisqualis indica</i> ) has also been identified as a potential pest species in local government Pest Management Plans for the Cape York Peninsula in northern Queensland. It is possibly also becoming naturalised along creeks in Brisbane in south-eastern Queensland."

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Weedy tendencies with potential for negative environmental impacts

304	Environmental weed	

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Queensland Government. 2014. Weeds of Australia - Rangoon creeper - <i>Quisqualis indica</i> . <a href="http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm">http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Quisqualis_indica.htm</a> . [Accessed 12 Sep 2014]	[Potentially. Not conclusive at this point] "Rangoon creeper ( <i>Quisqualis indica</i> ) is regarded as an emerging environmental weed in northern Queensland and the northern parts of the Northern Territory and is a potential environmental weed or "sleeper weed" in other warmer and wetter parts of the country."
	Nevill, J. 2009. Mainstreaming Prevention and Control Measures for Invasive Alien Species into Trade, Transport and Travel across the Production Landscape. National IAS Baseline Report. GOS - UNDP - GEF	[Potentially] "Impacts. This fast growing light-loving vine is highly invasive. Climbing into the crowns of trees it has the potential to dominate large areas as is the case on Mahe and Praslin. It propagates vegetatively by root suckers and by seed that can be water dispersed."

305	Congeneric weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Pott, A., Pott, V. J., & de Souza, T. W. 2006. Pasture weeds in the Brazilian cerrado region. Embrapa Gado de Corte, Campo Grada, Brazil	[ <i>Combretum discolor</i> ] "This book presents illustrations and descriptions of over 100 of the main pasture weeds of central western Brazil. Some of the most important include <i>Acacia farnesiana</i> , <i>Acosmium subelegans</i> , <i>Andira humilis</i> [ <i>Andira laurifolia</i> ], <i>Annona coriacea</i> , <i>Calliandra parviflora</i> , <i>Casearia sylvestris</i> , <i>Cenostigma macrophyllum</i> , <i>Cercidium australe</i> , <i>Cnidocaulon cnicodendron</i> , <i>Combretum discolor</i> ..." "Brief botanical characters and remarks on the importance, ecology, mechanical control, usefulness and distribution are given for each species. Most are woody plants, predominating spiny species in forest areas and shrubs with strong underground persistence organs. Approximately two-thirds are cerrado species. Half of the weeds belong to the legume, bignoniaceae and compositae families."
	Holm, L. G., Pancho, J.V., Herberger, J.P. & Plucknett, D.L. 1979. A Geographical Atlas of World Weeds. John Wiley and Sons, New York, NY	Two congeners are principal weeds in Zimbabwe.

401	Produces spines, thorns or burrs	y
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 ( <i>Clusiaceae</i> through <i>Araliaceae</i> ). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"petiole persistent and thornlike" ... "Lianas to 8 m tall. Branchlets brownish yellow pubescent. Petiole 5–9 mm, without an inflated joint near base, densely brown pilose when young; leaf blade mostly oblong-elliptic or elliptic, 5–18 × 2.5–7 cm, abaxially sometimes brown pilose, adaxially glabrous except slightly brown pilose on midvein, finely white verruculose, rarely tomentose on both surfaces, base obtuse, apex acuminate to shortly caudate; lateral veins in 7 or 8 pairs."

Qsn #	Question	Answer
402	<b>Allelopathic</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Fujii, Y., Parvez, S. S., Parvez, M., Ohmae, Y., & Iida, O. 2003. Screening of 239 medicinal plant species for allelopathic activity using the sandwich method. <i>Weed Biology and Management</i> , 3(4): 233-241	[Possibly. Demonstrates allelopathy in laboratory conditions] "Table 1. Screening of leaf litter of 239 medicinal plant species under different families using the sandwich method" [Quisqualis indica - ** indicates increasingly strong inhibitory activity.]
403	<b>Parasitic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. <i>Flora of China</i> . Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence] "Lianas to 8 m tall." [Combretaceae]
404	<b>Unpalatable to grazing animals</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2014. Personal Communication	Unknown
405	<b>Toxic to animals</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 2</i> . PROTA Foundation, Wageningen, Netherlands	[Unknown if animals can be poisoned by seeds] "The prospects for <i>Combretum indicum</i> seeds as an anthelmintic are limited, due to the toxic side-effects of quisqualic acid."
406	<b>Host for recognized pests and pathogens</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 2</i> . PROTA Foundation, Wageningen, Netherlands	"Diseases and pests. <i>Combretum indicum</i> is a host to a wide variety of insects, including aphids, scale insects and caterpillars, as well as nematodes, fungi and various crop viruses. These pests and diseases are mainly documented from Asian countries, but probably several of these problems also occur in tropical Africa."

Qsn #	Question	Answer
407	Causes allergies or is otherwise toxic to humans	
	<b>Source(s)</b>	<b>Notes</b>
	Globinmed. 2014. Quisqualis indica. <a href="http://www.globinmed.com/index.php?option=com_content&amp;view=article&amp;id=84962:quisqualis-indica&amp;catid=719:q">http://www.globinmed.com/index.php?option=com_content&amp;view=article&amp;id=84962:quisqualis-indica&amp;catid=719:q</a> . [Accessed 12 Sep 2014]	[Possibly if taken internally] "Mildly toxic, side-effects such as nausea, vomiting and belching (toasting the herb decreases its toxicity), occasionally allergic reaction with skin rashes with or without itching, painful swelling of ankles, increase in body temperature. Overdose: headache, dizziness, nausea, vomiting, diarrhoea, abdominal pain, sweating, cold limbs leading to seizures, drop in blood."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[Possibly] "The prospects for <i>Combretum indicum</i> seeds as an anthelmintic are limited, due to the toxic side effects of quisqualic acid."
408	Creates a fire hazard in natural ecosystems	n
	<b>Source(s)</b>	<b>Notes</b>
	Nevill, J. 2009. Mainstreaming Prevention and Control Measures for Invasive Alien Species into Trade, Transport and Travel across the Production Landscape. National IAS Baseline Report. GOS - UNDP - GEF	[Could act as a fuel ladder, but generally not occurring in fire prone habitat] "Q. indica is a ligneous vine that can reach up to 8m in its native range it is typically found on the edges of primary forest, in secondary forests, riverbanks and thickets from sea-level up to about 100m."
409	Is a shade tolerant plant at some stage of its life cycle	
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[Possibly shade tolerant] "It prefers full sun, but light shade is tolerated."
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	<b>Source(s)</b>	<b>Notes</b>
	Aguilar, N.O., 1999. Quisqualis L.[Internet] Record from Proseabase. de Padua, L.S., Bunyapraphatsara, N. and Lemmens, R.H.M.J. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 10 Sep 2014]	"It occurs from sea-level up to 300 m altitude, preferably in full sunlight, on a wide range of soils, but preferably on well-drained soils."



Qsn #	Question	Answer
411	<b>Climbing or smothering growth habit</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2007. Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Lianas to 8 m tall. Branchlets brownish yellow pubescent. Petiole 5–9 mm, without an inflated joint near base, densely brown pilose when young; leaf blade mostly oblong-elliptic or elliptic, 5–18 × 2.5–7 cm, abaxially sometimes brown pilose, adaxially glabrous except slightly brown pilose on midvein, finely white verruculose, rarely tomentose on both surfaces, base obtuse, apex acuminate to shortly caudate; lateral veins in 7 or 8 pairs. Inflorescences lax; bracts deciduous, filiform-linear to ovate, 3–12 mm, brown pilose."

412	<b>Forms dense thickets</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Nevill, J. 2009. Mainstreaming Prevention and Control Measures for Invasive Alien Species into Trade, Transport and Travel across the Production Landscape. National IAS Baseline Report. GOS - UNDP - GEF	[A component of thicket vegetation] "Q. indica is a ligneous vine that can reach up to 8m in its native range it is typically found on the edges of primary forest, in secondary forests, riverbanks and thickets from sea-level up to about 100m."

501	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Aguilar, N.O., 1999. Quisqualis L.[Internet] Record from Proseabase. de Padua, L.S., Bunyapraphatsara, N. and Lemmens, R.H.M.J. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 10 Sep 2014]	[Terrestrial] "Quisqualis indica is occasionally found in the same habitat, but more often in more disturbed habitats such as secondary forest, thickets, along streams, and even as a weed along roadsides, on waste places, in rice fields and along railway tracks."

502	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed ]	Combretaceae

503	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <a href="http://www.ars-grin.gov/">http://www.ars-grin.gov/</a> . [Accessed 12 Sep 2014]	Combretaceae

504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Flora of Australia Online. 2014. <i>Quisqualis indica</i> . <a href="http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.aspx?pnid=55060">http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.aspx?pnid=55060</a> . [Accessed 12 Sep 2014]	"Climbing shrub; old stems thorny; branchlets pubescent. Leaves elliptic to oblong, rounded to subcordate at base, shortly acuminate, sparsely pubescent beneath; lamina 4–18 cm long; petiole 5–15 mm long. Spikes 4–10 cm long; bracts 5–10 mm long, narrow. Flowers showy, fragrant, becoming pendulous."

601	Evidence of substantial reproductive failure in native habitat	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 2</i> . PROTA Foundation, Wageningen, Netherlands	[No evidence] " <i>Combretum indicum</i> is native to tropical Asia. There is still doubt whether it is indigenous to East Africa or was introduced there long ago. It is nowadays widely cultivated throughout the tropics and subtropics, mainly as an ornamental plant, and has become naturalized in many localities." ... " <i>Combretum indicum</i> is commonly planted as an ornamental throughout the tropics and subtropics, and is therefore not threatened by genetic erosion."

602	Produces viable seed	y
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 2</i> . PROTA Foundation, Wageningen, Netherlands	" <i>Combretum indicum</i> can be propagated by seeds, stem cuttings, air layering and root suckers."
	Aguilar, N.O., 1999. <i>Quisqualis</i> L.[Internet] Record from Proseabase. de Padua, L.S., Bunyaphatsara, N. and Lemmens, R.H.M.J. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 10 Sep 2014]	"Fruiting plants are rare in many localities."
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Since seed is rarely formed, propagation is usually by 3-4" woody cuttings. When fruit is set, though, the seedlings can form a thick understory beneath the parent plant, indicating that Rangoon creeper might become invasive given the right conditions."
	Eisikowitch, D., & Rotem, R. 1987. Flower orientation and color change in <i>Quisqualis indica</i> and their possible role in pollinator partitioning. <i>Botanical Gazette</i> 148(2): 175-179	[Not in Israel] "At night, white flowers are visited by hawkmoths, while the red flowers are neglected by night visitors. During the day, pink and red flowers are visited by a wide range of visitors: solitary bees, honeybees, flies, and sunbirds. Pollen grains germinate well on the stigmatic fluid during the first few hours, but germination is reduced during the day. Pollen tubes do not penetrate into the style, and seeds are not produced in Israel."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2014. Personal Communication	Unknown

604	Self-compatible or apomictic	
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Kubitzki, K., Bayer, C. 7 Stevens, P.F. The families and genera of vascular plants: Volume IX. Flowering Plants. Eudicots. Springer-Verlag, Berlin, Heidelberg, New York	[Related species self-incompatible, but unknown for <i>C. indicum</i> ] " <i>Combretum fruticosum</i> ..." ... "This species has been shown to be self-incompatible (Bernardello et al. 1994)."

605	Requires specialist pollinators	y
	<b>Source(s)</b>	<b>Notes</b>
	Flora of Australia Online. 2014. <i>Quisqualis indica</i> . <a href="http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.xsql?pnid=55060">http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.xsql?pnid=55060</a> . [Accessed 12 Sep 2014]	"Pollination depends upon the presence of a long-tongued insect pollinator which may be absent from Christmas Is. "
	Eisikowitch, D., & Rotem, R. 1987. Flower orientation and color change in <i>Quisqualis indica</i> and their possible role in pollinator partitioning. <i>Botanical Gazette</i> 148(2): 175-179	[Primarily hawkmoth pollinated] "During the day, pink and red flowers are visited by a wide range of visitors: solitary bees, honeybees, flies, and sunbirds. Pollen grains germinate well on the stigmatic fluid during the first few hours, but germination is reduced during the day. Pollen tubes do not penetrate into the style, and seeds are not produced in Israel. Nectar flow begins at flower dehiscence, reaches its peak at early morning, and then is absorbed by the flower. During the first hours of blooming, the flower is typically "hawkmoth" but, by the next morning, attracts visitors other than hawkmoths."
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Suggests pollinator limitations] "Since seed is rarely formed, propagation is usually by 3-4" woody cuttings. When fruit is set, though, the seedlings can form a thick understory beneath the parent plant, indicating that Rangoon creeper might become invasive given the right conditions."

606	Reproduction by vegetative fragmentation	y
	<b>Source(s)</b>	<b>Notes</b>
	Flora of Australia Online. 2014. <i>Quisqualis indica</i> . <a href="http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.xsql?pnid=55060">http://www.anbg.gov.au/abrs/online-resources/flora/stdisplay.xsql?pnid=55060</a> . [Accessed 12 Sep 2014]	"It spreads by root suckers as well as by seed."

607	Minimum generative time (years)	
	<b>Source(s)</b>	<b>Notes</b>
	Nevill, J. 2009. Mainstreaming Prevention and Control Measures for Invasive Alien Species into Trade, Transport and Travel across the Production Landscape. National IAS Baseline Report. GOS - UNDP - GEF	[Time to first flowering unknown, but ability to spread by suckers may allow this species to spread prior to reaching sexual maturity] "It propagates vegetatively by root suckers and by seed that can be water dispersed."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	"The fruits are buoyant in both fresh water and seawater and are thus dispersed."
	Flora of Australia Online. 2014. <i>Quisqualis indica</i> . <a href="http://www.anbg.gov.au/abrs/online-resources/flora/stddisplay.aspx?pnid=55060">http://www.anbg.gov.au/abrs/online-resources/flora/stddisplay.aspx?pnid=55060</a> . [Accessed 12 Sep 2014]	[Possibly could spread by discarded garden waste] "It spreads by root suckers as well as by seed."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"cultivated worldwide in tropical regions as an ornamental." ... "In Hawai'i, Rangoon creeper is grown in gardens below 1000' elevation with ample room in which it can spread;"

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Unlikely given limited seed production in cultivation] "Since seed is rarely formed, propagation is usually by 3-4" woody cuttings. When fruit is set, though, the seedlings can form a thick understory beneath the parent plant, indicating that Rangoon creeper might become invasive given the right conditions."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	"The fruits are buoyant in both fresh water and seawater and are thus dispersed."

705	Propagules water dispersed	y
	Source(s)	Notes
	Jackson, G. 1974. Cryptogeal germination and other seedling adaptations to the burning of vegetation in savanna regions: The origin of the pyrophytic habit. <i>New Phytologist</i> , 73(4): 771-780	" <i>Quisqualis indica</i> grows along the banks of the wide sandy-bedded rivers of northern Nigeria where the vegetation burns in the dry season. It is a scrambling untidy shrub with a tendency to climb."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	"The fruits are buoyant in both fresh water and seawater and are thus dispersed."
	Aguilar, N.O., 1999. <i>Quisqualis</i> L.[Internet] Record from Proseabase. de Padua, L.S., Bunyaphatsara, N. and Lemmens, R.H.M.J. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 10 Sep 2014]	"The fruits of <i>Quisqualis</i> are buoyant in both fresh water and seawater, and are thus dispersed."

706	Propagules bird dispersed	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	"The fruits are buoyant in both fresh water and seawater and are thus dispersed."

707	Propagules dispersed by other animals (externally)	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	[Fruits and seeds also lack means of external attachment] "The fruits are buoyant in both fresh water and seawater and are thus dispersed."

801	Prolific seed production (>1000/m2)	n
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[High seed densities unlikely in the Hawaiian Islands] "Since seed is rarely formed, propagation is usually by 3-4" woody cuttings. When fruit is set, though, the seedlings can form a thick understory beneath the parent plant, indicating that Rangoon creeper might become invasive given the right conditions."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	"Seeds germinate easily when fresh." ... "Dried fruits can be stored for up to 1 year, but the effect of storage on the quisqualic acid content is not yet known."
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 12 Sep 2014]	"Storage Behaviour: No data available for species. Of 1 known taxa of genus Quisqualis, 100.00% Orthodox(p/?)"

803	Well controlled by herbicides	
	<b>Source(s)</b>	<b>Notes</b>
	Dunlop, E., Hardcastle, J. & Shah, N.J. 2005. Cousin and Cousine Islands Status and Management of Alien Invasive Species. World Bank / GEF funded project: 'Improving management of NGO and privately-owned Nature Reserves and high biodiversity islands in Seychelles'	[Possibly Yes] "In one instance, a herbicide 'Vigilant' is used to aid in control of the invasive rangoon creeper ( <i>Quisqualis indica</i> ) on Cousin. Vigilant is a low toxicity herbicide gel containing 5% picloram as the active ingredient. It is used on woody weed species where the gel is applied directly to the freshly cut plant stem. This treatment has been in use on Cousin since late November 2004, and to date the results appear promising."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2013. Plant Resources of Tropical Africa 11(1). Medicinal Plants 2. PROTA Foundation, Wageningen, Netherlands	" <i>Combretum indicum</i> can be maintained as a large shrub with vigilant pruning."

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Tolerates heavy pruning] "Pruning is necessary to keep this rampant climber in bounds."

805	<b>Effective natural enemies present locally (e.g. introduced biocontrol agents)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2014. Personal Communication	Unknown

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized on Oahu, Hawaiian Islands and other tropical locations
- Weedy tendencies, and a potential environmental weed
- Other *Combretum* species have become invasive
- Petiole persistent and thorn-like
- Potentially allelopathic
- Seeds potentially toxic
- Tolerates many soil types
- Climbing/smothering habit
- Seeds water dispersed & spread intentionally by people
- Able to spread vegetatively by root suckers
- Tolerates repeated pruning

## Low Risk Traits

- Ornamental
- Specialized pollinator requirements may limit seed set
- Herbicides may provide effective control